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(54) Refrigerated Cabinet

Described is a refrigerated cabinet having a refrigerated compartment 4 which is designed for the insertion of a pallet 5 or a container. The compartment contains a device for lifting the pallet or container, which device is preferably connected to the refrigerated cabinet and has at least one vertical guide rail 6 on the rear wall of the compartment and also a supporting arm 10 guided in the guide rail.

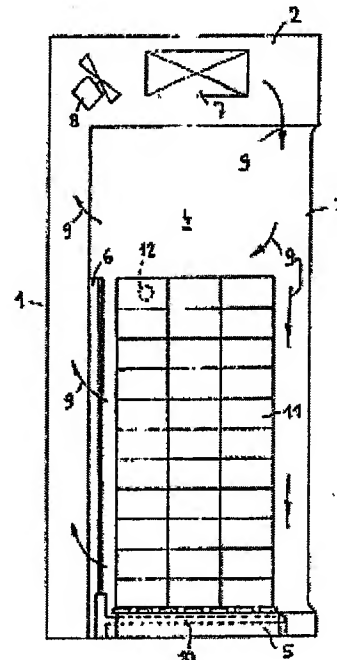


Fig. 1

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## Claims

1. Refrigerated cabinet having a refrigerated compartment, which is designed for the insertion of a pallet or a container, characterized in that the compartment contains a device for lifting the pallet or the container.
2. Refrigerated cabinet according to claim 1, characterized in that the device for lifting is connected to the refrigerated cabinet.
3. Refrigerated cabinet according to claim 1 or 2, characterized in that the device for lifting comprises at least one vertical guide rail on a rear wall of the compartment and also a supporting arm for the pallet or the container, said supporting arm being guided in the guide rail.
4. Refrigerated cabinet according to one of the claims 1 to 3, characterized in that vertical supports for cooling units are designed in the upper region of the refrigerated cabinet as guide rails for the device for lifting.
5. Refrigerated cabinet according to one of the claims 1 to 4, characterized in that a cover is provided in the area between the bottom and the supporting arm.
6. Refrigerated cabinet according to claim 5, characterized in that the cover is designed as an advertising medium.
7. Refrigerated cabinet according to one of the claims 1 to 6, characterized in that the supporting arm is supported by means of a pressure spring.
8. Refrigerated cabinet according to one of the claims 1 to 7, characterized in that the device for lifting contains at least one gas spring.
9. Refrigerated cabinet according to one of the claims 1 to 8, characterized in that the device for lifting includes hydraulic or pneumatic lifting equipment.
10. Refrigerated cabinet according to one of the claims 1 to 9, characterized in that the device for lifting includes an electric motor.
11. Refrigerated cabinet according to one of the claims 1 to 10, characterized in that in the compartment there is provided a light barrier, which, when closed, activates the lifting process.
12. Refrigerated cabinet according to one of the claims 1 to 4, characterized in that the device for lifting has a load-dependent height adjusting mechanism.

## Description

The invention relates to a refrigerated cabinet having a refrigerated compartment, which is designed for the insertion of a pallet or a container.

Refrigerated cabinets of this type are used in supermarkets, in particular, for selling refrigerated or frozen goods packed in cartons. Goods from pallets or mobile containers, in particular, are sold at a high rate. Examples include milk, ice cream, pizza, frozen vegetables etc. The goods are made to move on the pallet or in the container from a cold storage room to the refrigerated cabinet and are inserted into the appropriately dimensioned compartment of the refrigerated cabinet. The refrigerated cabinet comprises outlet openings for refrigerating air, which refrigerates the compartment and the goods located therein. Such a refrigerated cabinet is described by way of example in the German unexamined laid-open patent application DE 34 14 033.

The pallet or the container is usually at ground level; the goods stacked thereon are gradually sold from the top. The topmost layer located at the customer's eye level when the pallet or the container is full, is thus at an increasingly lower level as the number of goods removed increases. In order for the goods to be constantly positioned well within the customer's field of vision, it is necessary to replenish the goods continuously. However, this is time-consuming and the process of inserting filled pallets nullifies the advantage of the rapid replenishment of goods. Should the replenishing process be omitted on the other hand, the goods cannot be seen easily and the customer is required to bend in order to remove the goods. As a result, the volume of sales is affected adversely.

It is therefore the object of the presented invention to provide a refrigerated cabinet of the type mentioned in the introduction, which refrigerated cabinet makes it possible to arrange the presentation of goods clearly even without requiring them to be replenished constantly.

This object is attained according to the invention by the fact that the compartment contains a device for lifting the pallet or the container.

The device for lifting contains, for example, one or more supporting arms or a platform on which the pallet or the container is placed during its insertion into the compartment and with the help of which the pallet or the container can be lifted once the topmost layers of goods are sold. In this manner, the topmost layer of goods can be kept

constantly within the customer's optimal field of vision and reach regardless of the quantity of the goods still located on the pallet or in the container. For this purpose, it is not necessary to replenish the assortment of goods if a pallet or a container is only partially empty.

Although it is possible to arrange the lifting device in the compartment without any direct connection to the refrigerated cabinet, for example, at the bottom, said lifting device is connected to the refrigerated cabinet according to a preferred embodiment of the invention.

It is particularly advantageous if, as suggested subsequently, the device for lifting comprises at least one vertical guide rail on a rear wall of the compartment and also a supporting arm for the pallet or the container, said supporting arm being guided in the guide rail.

The supporting arm can be raised and lowered vertically in the guide rail. The supporting arm is preferably connected to a platform on which the pallet or the container is placed. In another preferred embodiment, the supporting arm or several supporting arms engage in corresponding pick-up devices on the pallet or on the container in order to be able to lift the latter.

In another preferred embodiment of the object of the invention, vertical supports for cooling units are designed in the upper region of the refrigerated cabinet as guide rails for the lifting device.

This particularly simple and cost-effective possibility presents itself in the case of refrigerated cabinets in which cooling units, thus compressors and/or evaporators of a refrigeration cycle are arranged in the top region of the refrigerated cabinets.

In a preferred refinement of the object of the invention, a cover is provided in the region between the bottom and the supporting arm.

The cover, which is supposed to extend at least over the front side of the refrigerated cabinet and which hides those parts of the lifting device which are located below the container or the pallet, is advantageously fixed to the supporting arm/s or to a platform connected to the supporting arm/s. The cover is advantageously produced from a foldable material, e.g. a curtain or is composed of plates in a manner resembling Venetian blinds, in order to form the smoothest and most even surface possible between the bottom and the supporting arm regardless of the respective height of the supporting arm.

According to a preferred refinement of the object of the invention, the cover is designed as an

advertising medium; for example, it is provided with an inscription.

In a preferred refinement of the object of the invention, the supporting arm is supported by a pressure spring. The pressure spring compensates for at least one part of the load resting on the supporting arm.

In a preferred embodiment of the object of the invention, the device for lifting contains at least one gas spring.

In a preferred refinement of the object of the invention, the device for lifting includes hydraulic or pneumatic lifting equipment.

In another preferred refinement of the object of the invention, the device for lifting includes an electric motor. Here, the supporting arm is connected to the electric motor, for example, by means of a drive chain and a suitable reduction ratio.

In a preferred refinement of the object of the invention, the lifting process is controlled automatically. For this purpose, in the compartment there is provided a light barrier, the light beam of which is interrupted in the non-operative state by the goods located on the pallet or in the container. The light barrier closes when a part of the goods is sold. The receptor of the light barrier interacts operatively with the lifting equipment. Once the light barrier is closed, the lifting equipment is activated and the supporting arm is lifted long enough until the light barrier is interrupted again.

In a preferred refinement of the object of the invention, the device for lifting has a load-dependent height adjusting mechanism. Here, the pallet or the container is located in the lowest position possible when filled completely. Once a part of the goods is removed, and the load resting on the device for lifting has reduced, the lifting device lifts the pallet or the container a bit until the pallet or the container reaches the highest position possible when completely empty. The load-dependent height adjusting mechanism can be achieved advantageously by means of a pressure spring which is accordingly adapted to the load expected. The pressure spring can be compressed e.g. hydraulically to insert a new pallet.

The invention and also other details of the invention are explained in detail based on schematically illustrated exemplary embodiments, of which:

Fig. 1 shows a refrigerated cabinet according to the invention with a filled pallet,

Fig. 2 shows a refrigerated cabinet according to the invention with a partially empty pallet.

The refrigerated cabinet has a refrigerated compartment 4, which is surrounded by a rear wall 1, a structure 2 and lateral glazing 3. The size of the compartment 4 is dimensioned such that a standard pallet 5 or a container on fixed wheels can be inserted therein.

In the structure 2 there are provided a refrigerant evaporator 7 and a fan 8 for circulating refrigerating air. On the lower side of the structure 2 an opening is located, through which a refrigerating air stream is blown into the compartment 4. Depending on the intended use of the refrigerated cabinet, the compartment 4 is refrigerated at a temperature above or below 0°C. On the rear wall 1, openings for suctioning air from the compartment are located 4. Arrows 9 indicate the flow of the refrigerating air stream.

On the rear wall 1 in the compartment 4 there is a vertical guide rail fixed 6 in which a supporting arm 10 is guided. The pallet 5 is placed on the supporting arm 10.

If a container fixed on wheels is supposed to be accommodated in the compartment 4 instead of a pallet, said container fixed on wheels can be put down, for example, on a platform connected to the supporting arm 10. Furthermore, it is naturally feasible to provide two or more supporting arms instead of only one.

On the pallet 5 there is located a stack of goods 11, for example, ice cream packed in cartons. The height of the stack is selected such that the topmost layer of goods is located in the customer's best field of vision and reach.

As the goods get sold, the topmost layer would be located at an increasingly lower level and the customer would be able to reach or see it only with difficulty. For this reason, the supporting arm 10 is coupled to a lifting equipment with the help of which the supporting arm and with it the topmost layer of goods also can be lifted corresponding to the sale of goods.

Fig. 2 shows the refrigerated cabinet with a large part of the goods having been sold already. With the help of a gas spring 13, which is connected on the one hand to the refrigerated cabinet and to the supporting arm on the other, the supporting arm is lifted such that the topmost layer of goods continues to be within the customer's best field of vision and reach. The gas spring can be provided with a venting facility for lowering the supporting arm.

A cover 14 is fixed to the front end of the supporting arm, which cover 14 is preferably provided with an advertising inscription. The cover 14 is unrolled, for example, when the supporting arm 10 is being lifted.

For lifting the supporting arm, for example, a pressure spring, a hydraulic or pneumatic device or a chain drive with an electric motor can be used in addition to the gas spring 13 shown. The operating personnel can carry out the lifting process manually, if required, or in a load-dependent manner, i.e. the supporting arm is lifted increasingly as the load decreases.

Another possibility, which is advantageous particularly in connection with an electric motor, is the control of the lifting movement by means of a light barrier. The light barrier is located just below the topmost layer of goods. The receptor 12 (Fig. 1) of the light barrier receives no light initially. When the topmost layer of goods is sold, the light beam hits upon the receptor 12, by means of which the actuator for the supporting arm is activated. The supporting arm is lifted till the topmost layer of goods interrupts the light barrier once again.

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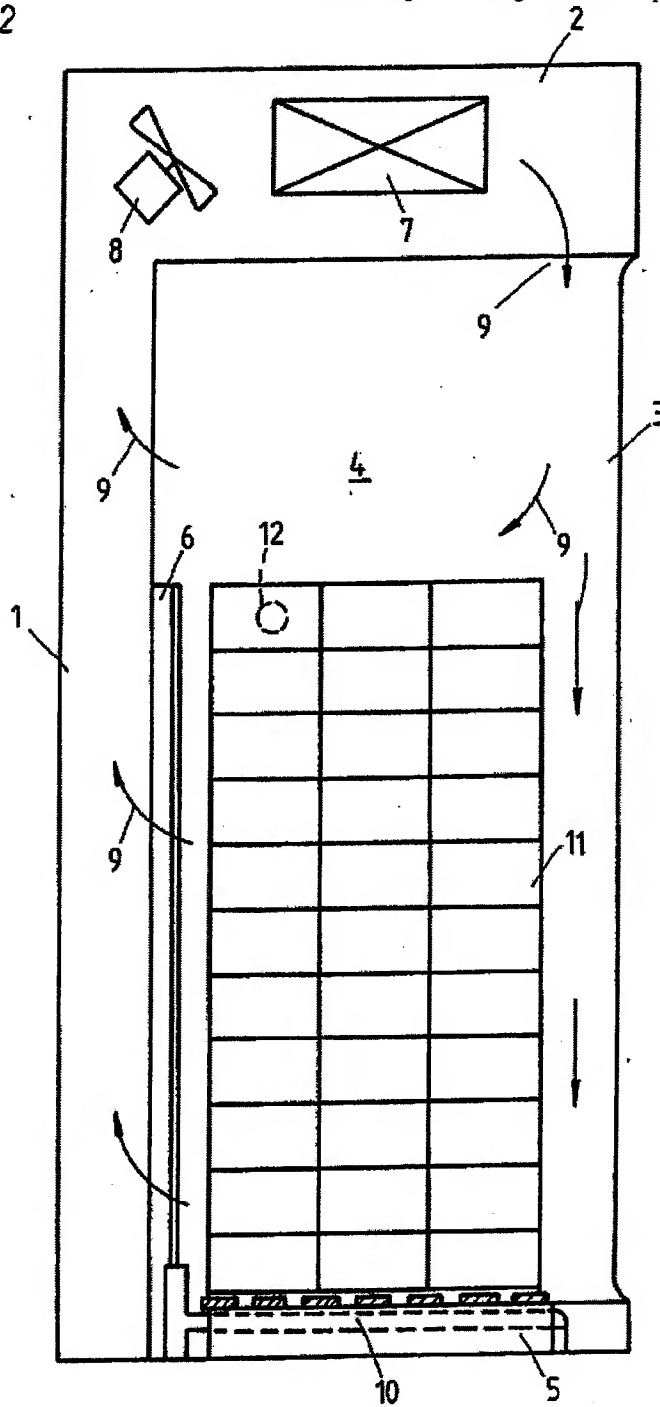


Fig.1

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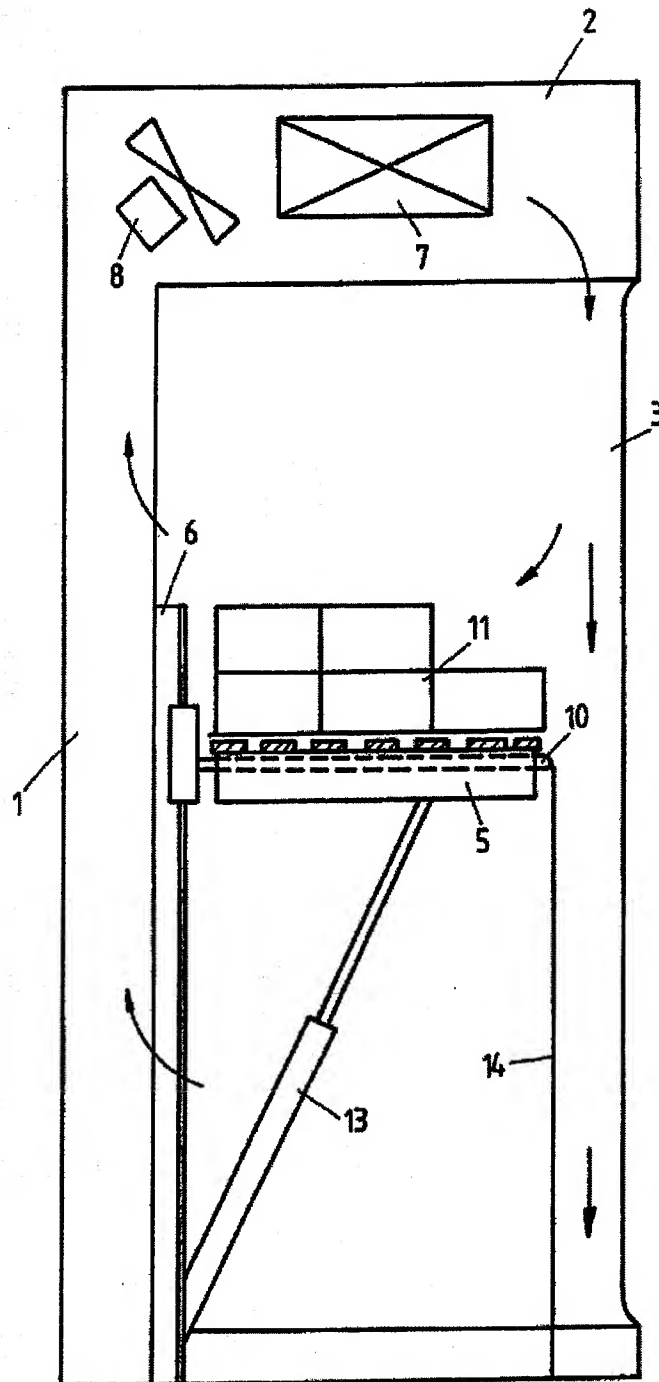


Fig. 2